CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
JANUARY 20, 2006 MEETING SUMMARY
San Jose State Building, Alquist Auditorium
100 Paseo de San Antonio
San Jose, CA 95113

SAT members present: Loo Botsford, Mark Carr, Doyle Hanan, Steven Murray, Jeff Paduan, Linwood Pendleton, Kenneth Schiff, Astrid Scholz, Rick Starr, Dean Wendt, Mary Yoklavich

SAT members not present: Steve Gaines, Rikk Kvitek, Steve Palumbi, Kevin Piner, Dave Schaub, Susan Schlosser, William Sydeman, Richard Young

Others present: Dr. Steve Barrager (SAT consultant), Michael DeLapa (MLPA staff), Heather Galindo (note taker; SAT support staff), Carrie Kappel (note taker; SAT support staff), John J. Kirlin (MLPA staff), Dr. Mary Gleason (MLPA staff), Paul Reilly (DFG staff), John Ugoretz (acting SAT chair; DFG staff) and approximately 15 members of the public

Acronyms used: California Department of Fish and Game (DFG), California Fish and Game Commission (F&GC), fraction of lifetime egg production (FLEP), Marine Life Protection Act (MLPA), marine protected area (MPA), MLPA Blue Ribbon Task Force (BRTF), MLPA Master Plan Framework (MPF), MLPA Master Plan Science Advisory Team (SAT), state marine conservation area (SMCA), state marine park (SMP), state marine reserve (SMR), state marine recreational management area (SMRMA)

Welcome, review of agenda and recent updates

John Ugoretz and John Kirlin thanked the SAT for their work in reviewing the packages that the SAT received in late December. They also acknowledged the huge amount of work done by the CCRSG, the package proponents, and MLPAI staff. They highlighted the fact that the process is at a critical juncture. The packages and SAT evaluation of them will be discussed by the BRTF January 31 – February 1 in Morro Bay. The task force will then have its final deliberations about the packages in mid-March. The focus of today's meeting will be on articulating and distilling down high level, big picture insights from SAT evaluation of the packages for communication to the BRTF.

Frameworks for SAT Report on Packages to BRTF

Initial identification of high level differences among the packages

Key differences and similarities among the packages identified by SAT members include:

- Most of packages focused on shallow rather than deep habitats.
- All packages left out sandy beaches in subregion 2, Capitola to Monterey.
- All packages potentially impact commercial and recreational fisheries, but they do so unevenly. Package 1 is relatively more successful in having lesser impacts on the well-represented fisheries within the stakeholder group. Less well-represented user groups (i.e., fisheries that were not represented on the CCRSG) were potentially more impacted.

It was mentioned that the desire of CCRSG members to reach consensus may have resulted in some areas being left out that otherwise might have been included, because stakeholders felt they were important.

Trial Run of Staff and SAT Analysis of MPA Packages Presentation to BRTF

How SAT evaluated packages in relation to MLPA goals

Mark Carr gave an overview of the draft evaluation process to date. SAT members have aimed to assess how well the packages meet the *science-based* goals of the MLPA (i.e., goals 1, 2, 3, 4, and 6). Implicit in this assessment is evaluating how well the packages meet the SAT's science guidelines that are part of the MPF.

The analyses that have been conducted so far, which should be considered initial draft assessments, include:

1. Mary Yoklavich, Rick Starr and Mark Carr conducted assessments of goals 1 and 4 (ecosystem protection, habitat representation).
2. Loo Botsford and Steve Gaines conducted analyses of whether the proposed MPAs would meet goals 2 and 6, by evaluating the degree to which they function as a network and would support sustainable populations.
3. Steve Palumbi evaluated how the packages might contribute to research (goal 3), by looking at replication within the packages.
4. Astrid Scholz and Linwood Pendleton have conducted additional socioeconomic analyses.
5. Students from the Bren School have done further analysis of the socioeconomic and ecological performance of the different packages using MARXAN, but the SAT has not been involved in and is largely unaware of the details of this analysis or its outcome.

The SAT has not yet determined how well each package meets the science-based goals. These analyses are preliminary and the general approaches must be vetted by the SAT today. Based on the SAT's input, we will complete our analyses of how well the packages meet the goals. The SAT must also identify what to present to the BRTF as summary material for each analysis and the overall evaluation.

What the SAT does *not* intend to do:

- Address non-science related issues
- Analyze and compare individual MPAs
- Recommend alterations to specific MPAs
- Detail the relative merits of alternative MPAs at a particular site, unless asked specific questions by BRTF members
- Analyze package B further (rationale in text of protection level document)
- Consider federal MPAs

Summary of packages

Mary Gleason gave a brief summary of the six different packages that will be presented to the BRTF:

1. Package 0 (existing central coast MPAs)
2. Packages produced by the CCRSG (revised to take into account SAT feedback from November meeting)
    a. Package 1
    b. Package 2
    c. Package 3
3. External packages
    a. Package AC
    b. Package B

Each package includes materials provided by the proponents: maps with locations of proposed MPAs, a cover letter from the proponents, a written rationale, and a summary matrix that covers the goals and objectives, proposed regulations and species likely to benefit for each individual MPA. Along with these are materials provided by the staff: a package summary, maps, side-by-side comparison of regulations for each package, and information about the area, depth range, and habitat representation by proposed MPA designation and also by SAT level of protection (discussed further below).

In addition, several figures are included:

- Percentage of total area in region in proposed MPAs by proposed designation – parks all at <1%, packages range from 7-13% for SMCAs, 4-17% for SMRs
- Changes in packages between Nov 23 and Dec 15 versions
- Percentage of study region by SAT level of protection

To make the evaluation easier and more digestible, all analyses used the same seven subregions (see map). For the BRTF, staff have produced side-by-side maps by subregion and tried to identify areas of convergence and divergence among packages.

Ecosystem protection and habitat representation (goals 1 & 4)

Rick Starr explained the approach used to evaluation the packages' performance under goals 1 and 4. SAT members used GIS data provided by MPLA Initiative staff on lengths, areas, and habitat types under protection. They eliminated some habitats, such as pinnacles, because data were of poor quality. The team divided the analysis into subregions to evaluate habitat representation and developed a rationale for assigning protection levels.

The protection levels used by the team were:

- State marine reserve
- State marine conservation area (SMCA) high
- SMCA moderate

- SMCA low
- State marine park

Each MPA in each package was assigned one of these levels of protection. Team members then calculated the total percentage of each habitat type protected within each of the different protection levels. They then graphed the proportion of habitat protected at each level out of the total available habitat and compared those levels across eight different habitats. Some habitats were lumped (e.g. depth zones were combined within the category of shallow sand to yield two depth zones, shallow (<100m) and deep (>100m)). They then summarized the occurrence of high level protection (SMR or SMCA high) for each of the habitats in bins of 5, 10, 15 and 20% protection. A summary of how well each package meets the goals is yet to come.

Key assumptions of this evaluation:

1. Average kelp coverage data came from four years (1989, 1999, 2002, 2003)
2. Used subregions as scale for analysis, but not for presentation of results
3. Assigned protection levels based on allowed extractive activities (sewage outfalls, power plants, but mostly fishing activities)
    a. High protection
        i. SMR – no take
        ii. SMCA high – fishing for pelagics in water deeper than 50 m (depth based on scientific consensus from recent national meeting about strength of benthic-pelagic coupling)
    b. Moderate protection
        i. SMCA moderate – pelagic fishing in deeper water plus selected take of spot prawns, squid, and crab and giant kelp (by hand), fisheries with low bycatch
    c. Low protection
        i. SMCA low – any other type of extractive fishing activity (including salmon fishing in shallow water <50m, with potentially high bycatch)
        ii. SMP – recreational fishing allowed
4. Ignored small water and sewage outfalls and water intakes because effects small and diffuse relative to the size of MPAs
5. Used lowest level of protection afforded by the MPA to designate the protection level of the entire MPA (e.g. in an MPA that goes from shallow to deep water but allows salmon fishing throughout, MPA would be designated SMCAlow)
6. Lumped some habitats for simplicity
7. Evaluated packages with and without kelp harvest to examine implications of potential future changes in DFG kelp harvest policy
8. Separated hand and mechanical harvest of kelp
9. Chose to portray differences among habitats based on high protection levels (SMR and SMCA high) only
10. Created table of occurrence of 5, 10,15, and 20% of habitat protected

The figures provided in the evaluation packets illustrate:

1. Relative habitat availability across study region and within each subregion
2. Relative abundance of each habitat within each of the five MPA levels of protection for entire region and subregions. Bullets indicate log of absolute abundance of each habitat type within the subregion, so that the amount protected can be compared to the total habitat availability.
3. Comparison among the five proposed MPA packages of relative abundance of eight selected habitats across entire study region
4. Occurrence of high level protection (SMR, SMCA high) in ≥5%, ≥10%, ≥15% and ≥20% of available habitats in seven subregions for each package.

Note that including or excluding kelp harvest only made a difference in subregions 1 and 5, in which removing kelp harvest sometimes moved an MPA into the SMCA high or SMR category. It is important to identify to the BRTF that there is some effect of kelp harvest and to highlight to proponents of packages the differences that it might make.

Discussion

There was extensive SAT discussion about the assumptions and preliminary results of this analysis. In particular, the following issues were raised:

Many water quality effects were ignored in this analysis (e.g. entrainment of larvae in once-through cooling intakes of power plants, septic system runoff, etc.). Though ignoring these might make sense given the current paucity of data and the tight timeline, members of the SAT felt it was important to highlight these potential impacts for the BRTF and for future planning regions, to make it clear that more information is needed before the effects on MPA protection levels from entrainment, agricultural runoff, sedimentation, etc. can be quantified. One important variable to consider is the size of the area likely to be affected, relative to the size of the MPA. For example, local thermal effects from a cooling tank outfall might impact an SMR's effectiveness, but entrainment effects on larvae from a large power plant may go beyond the boundaries of a single MPA. Ken Schiff offered to help craft language around recommendations for future analyses of water quality effects on MPAs.

There was some concern that using these new levels of protection (SMCA high, moderate and low) in the analysis would be considered "moving the goal posts after the game is over." John Ugoretz indicated that the package proponents would be given another chance to revise packages in light of the SAT evaluation. SAT members involved in designing the analysis explained that assigning individual MPAs to these five categories allowed comparison among MPAs (and in particular SMCAs) with a wide range of differing regulations. The categories make the information easier to digest and present to the BRTF and also do a better job of capturing the subtle differences among SMCAs with different regulations that the stakeholders are trying to incorporate into their designs.

Other members were concerned that leaving out SMCA low and SMP designated areas (i.e., evaluating habitat representation only within SMR and SMCA high areas) suggests that these low to moderate protection areas are no different from no protection.

The group discussed the 50m depth rule, which was a "rule of thumb" for the depth below which pelagic and benthic communities are no longer strongly coupled, e.g. by food web interactions. This rule came out of two days of discussion in the benthic-pelagic coupling meeting in Monterey this last fall. This number is backed up by ecological information from the literature and additional information on bycatch from agencies and fishermen. SAT members who conducted this analysis were firm in applying the 50m rule, assuming that consistently applying this rule across all situations would be the most objective approach, but they realize that it is not a magic dividing line. In some cases MPAs go to 42m, and it could be more practical to move the boundary in such cases. At least one member of the SAT felt it was unfair to use the 50m dividing line to categorize an SMCA as low protection when most of the MPA is in deeper water.

In addition, Paul Reilly reported that stakeholders were concerned about the low protection level designation for SMCAs where recreational salmon fishing was allowed in waters only <50m. Some stakeholders believe that the rockfish bycatch associated with recreational salmon fishing in shallow water is much smaller than targeted harvest of rockfish. Paul Reilly mentioned that a recent DFG analysis showed that rockfish bycatch in the recreational salmon fishery is 1.5% of the total rockfish targeted harvest. Regardless of bycatch, there is also the issue of the indirect effects of harvest of pelagic species on benthic species via benthic-pelagic coupling, which is strong in shallow water. In addition, though the total level of recreational catch may be controlled, local levels of exploitation may vary greatly from place to place making it difficult to estimate local impacts of recreational fishing.

The SAT discussed a number of potential solutions to the 50m isobath problem, including giving the shallow and deeper water portions of an MPA different protection level designations for the analysis, setting a "proportion in shallow water" threshold, and giving proponents the option to designate adjacent shallow water SMRs and deepwater SMCAs in order to achieve the highest possible protection level without giving up deeper water pelagic fishing. The SAT agreed that rather than spend a lot more time increasing the resolution of this analysis, they would rather flag the issue for the BRTF when it potentially affects the results for a particular subregion or MPA. In addition, Rick Starr and MLPA Initiative staff will work to complete a full analysis of how the application of this rule and other assumptions might affect the evaluation results for one subregion (e.g. Capitola to Monterey Breakwater).

SAT members discussed where the 5, 10, 15, and 20% cutoffs came from and whether these were the appropriate bins. They discussed the possibility of using 5, 10, 20 and 40 as bins because these are the percentages that result from using the minimum and maximum size and spacing requirements from the MPF (i.e. 5 / 100 km; 5 / 50 km; 20 /100 km; 20 / 50 km). However, this assumes that habitats are distributed evenly throughout the region, when they are not. The group did agree to add one additional category, >30%, in order to capture the full range of variation in habitat representation.

SAT members discussed the fact that there is no ecological reason to assume that 5% of one habitat is equivalent to 5% of another habitat. These are merely meant to be convenient bins for more objective comparison.

SAT consensus on assumptions and suggested modifications:

1. Average kelp cover – OK
2. Subregions for analytical purposes only, not defining whether packages meet the goals or guidelines – OK
3. Protection level cutoff based on 50m isobath – OK with modification
    a. Give package proponents the chance to modify SMCAs to have higher protection at depths less than 50m
    b. Redo analysis for one example from Figure 4 (staff to work with Rick Starr).
    c. Highlight areas in Figure 4 where the 50m isobath and SMCA protection levels are an issue.
    d. Note that these analyses are in reference to goals 1 and 4, but we recognize that SMCAs address other goals as well.
4. Protection levels based on types of extractive activities allowed – Doyle Hanan, only objector – felt that protection levels were a bit arbitrary. Salmon fishing impacts in shallow water were a point of discussion.
5. Ignoring small water and sewage outfalls – OK with modification
    a. Will make statement of why this assumption was made and what the potential conflicts are (Ken Schiff to help write this)
6. Used lowest level of protection for entire MPA – OK with modification
    a. Will make statement highlighting this
    b. Will detail one example of how this might change things
7. Lumped habitats – OK
8. Evaluated with and without kelp harvest – OK
9. Different levels of protection for hand and mechanical kelp harvest – OK
10. Differences among habitats portrayed based on existence of SMR and SMCA high only – OK with modification
    a. Include footnote that states the exclusion of SMCAs and SMPs does not suggest that they have no value. For different goals, different MPAs have different values. This analysis (Table 1) is specific to goals 1 & 4.
11. Table of occurrences – 5, 10, 15, 20 and 30% habitat protected – OK with modification
    a. Add 30% as last bin so all percentages captured.
12. Discuss that these are for goals 1 & 4 only - OK

Suggestions for presentation of this analysis

- Evaluation results summarized on an overall package basis, rather than by subregions
- Brief description of process and products, focus on big picture
- Evaluation of performance with respect to guidelines – met or not?
- Evaluation of performance with respect to goals – met or not?
- Criteria for minimum habitat representation

Size and spacing (goals 2 & 6)

Mark Carr presented the evaluation that Steve Gaines undertook for size and spacing guidelines (related to goals 2 and 6). Steve calculated distances between and sizes of MPAs, categorized in different ways.

Steve compared, across different packages, the numbers of MPAs that fall within a given size range (shoreline distances which the SAT gave have been translated into square statute miles). Steve highlighted the number of MPAs that fall *below* the SAT minimum size recommendation, the number *at* the minimum size, and then those that are *greater* than the guideline. Separate figures show the results for clusters of MPAs (where a variety of different types of MPAs were proposed in close proximity to one another) and for high protection clusters (SMR and SMCA high).

Similarly, Steve analyzed the spacing of MPAs, highlighting areas that are close enough (fall within minimum spacing guideline), areas that are at the guideline distance, and areas that are beyond the guideline for maximum spacing (i.e., fail to meet the guideline). Note that when an MPA fails to meet the guideline, it breaks up the whole network. Individual problem MPAs can be identified on the included spreadsheets. Steve performed this analysis for all MPAs and for high protection MPAs only. For the high protection MPAS, there is little difference among the packages.

Steve then looked at spacing of individual habitat types within high protection MPAs. In general, connectivity was not as strong for deeper water habitats, where more of the clusters are too far apart to meet the SAT guidelines for maximum spacing.

Steve produced spreadsheets that provide further information about the size and spacing of individual MPAs. The first sheets show habitat types (rows) by proposed MPAs (columns) for each package, with cells coded by levels of protection (dark green – high, yellow – low, white – below the thresholds established for whether a habitat was considered to be included in that MPA or not – 20% for common habitats, 5% for less common habitats). Additional spreadsheets show the calculated distances between all MPAs, between high protection MPAs, and between representative habitat patches within high protection MPAs. This allows one to identify MPAs that are unconnected from others.

Finally, Steve included a graph of larval dispersal distances to illustrate which species would be able to disperse among MPAs separated by a given distance, below, within, or above the SAT guidelines for spacing. About 40% of species are able to disperse over the distances captured within the SAT range of distances (30-60 mi). Beyond that distance, <30% of species are capable of dispersing between adjacent MPAs.

Suggestions for presentation of this analysis

- Add the actual numbers of MPAs that fall within these zones in figures 1 and 2 (since many dots fall on top of each other).
- Tables 1 and 2 - change labels on both tables to say “below”, “at” and “above minimum” guideline. Add column with sample size (number of clusters).

- Figures 3 & 4 - Maybe reverse the x-axis, so that 'good' spacing is to the right as in first two figures.
- For connectivity and network function, even low or moderate protection MPAs may contribute. Need to consider the potential benefits of other types of MPAs, not just high level protection MPAs.
- Devise a way to represent habitat availability in the habitat-specific size and spacing analyses (i.e. spacing may be limited by availability of suitable habitat)?
- There needs to be a difference in the spreadsheet between an empty cell (no MPA) and one in which the habitat was too small to be counted. Spreadsheet should let you identify which of the MPAs might need to be revised. Don't need to include it in the presentation; will be most useful for proponents of packages.
- Label y-axis of graph of larval distances.
- Recommend making the point about what fraction of species are capable of dispersing over the range of distances via a bullet point rather than the graph.

Fraction of lifetime egg production (goals 2 & 6)

Loo Botsford gave a progress report on the fraction of lifetime egg production (FLEP) analysis. He stressed that he and his assistant do not yet have results ready to give to the BRTF. Their aim was to calculate the spatial distribution of persistent populations that would result from the proposed packages of MPAs in hard habitat within 0-30 m and 30-100 m depth zones. Loo showed graphs that describe how the distribution of all MPAs is related to the distribution of hard habitat along the coast in these two depth zones. He also graphed separately SMR distribution vs. hard habitat distribution in the two depth zones. In each graph, red on top = reserves, green on bottom = habitat distribution.

Next Loo showed results from simulations of FLEP for each package. For this analysis, they assumed that there are three different levels of FLEP – inside reserves over hard habitat, FLEP = 1.0, outside MPAs, no habitat FLEP = 0, outside MPAs, with habitat FLEP = 0-0.3 depending on fishery pressure. They ran simulations with this last parameter set to 0, 0.2 or 0.3 to assess the effects of different fishing pressures outside of MPAs. These analyses are based only on larval dispersal, assuming adult movement is zero. Based on previous analyses of stock recruitment data for single species, non-spatial management, they assumed that a population requires 35% recruitment in order to replace itself. Plots of equilibrium settlement show settlement levels for species with different dispersal distances – different color curves are settlement for different dispersal distances (1, 5, 15, 25 km).

Preliminary results: In shallow water (0-30m hard habitat) the existing MPAs (Package 0) are not well connected. Only short distance dispersers achieved simulated population levels above the 0.35 threshold. In deeper water (30-100m), there was some persistence for longer distance dispersers. For Package 1 in 0-30m, considering all MPAs, and FLEP = 0.2 in rocky habitat outside MPAs, there was persistence of short distance dispersers in all MPAs and longer distance dispersers in some places. When only SMRs are included, there are fewer places where medium and long distance dispersers will persist. An example short distance disperser is abalone; longer distance = rockfish, specifically kelp rockfish in shallower (0-30m) kelp habitats and vermillion, calico, and china rockfish on deeper rocky reefs (30-100+m). One can

also gauge the influence of fishing levels outside of MPAs by varying the assumed FLEP outside MPAs. Loo showed graphs of some preliminary results for this method.

This analysis lets you look at how size and spacing actually affect population persistence, taking habitat into consideration. It also helps you to relate the analysis and the packages to particular species.

Loo also plans to plot the percentage of available habitat area in which populations persist and to conduct sensitivity analyses of how changing some of the parameters (dispersal distance, fishing rate, FLEP, etc.) affects the results (e.g. how might changes in fishing regulations alter the persistence of populations?).

Suggestions for presenting these results

- Summarize these results in a table of species by packages, showing which species would be expected to persist where, based on their dispersal distances and the level of protection they receive in the different MPAs.
- Categorize about five different suites of species that represent a range of different life histories and different levels of exploitation. Make it less abstract – don't talk about parameters and values but about species and their stories.
- Make this a brief, complementary presentation to go with the size and spacing analysis that Steve Gaines produced. Loo and Steve will work together on meshing the two presentations.
- When you compare different MPA types, compare all MPAs to SMRs + SMCAhighs to make this analysis comparable to the other SAT analyses.

Discussion

For species with different dispersal distances, e.g. invertebrates and plants, which tend to have shorter dispersal distances, the results should be similar. All of this depends on the stock recruitment relationship at low population levels. Allee effects (density dependent changes in reproductive success at small population size) might change the slope of that relationship, which could alter the results, but in general results should be the same.

Potential commercial and recreational fishery impacts

Astrid Scholz presented preliminary results from the analysis of the relative potential commercial and fishery impacts of the different packages, performed by Ecotrust.

There were some updates to the evaluation package, correcting a few mistakes:

- For the commercial fisheries analysis - in Package 2 – Pt Lobos SMCA had been miscategorized as allowing salmon and spot prawn fishing, but take of these species is not allowed
- For the recreational analysis – Ecotrust had inadvertently been working with the wrong data layer. This has now been corrected and instead of angler trips, the new analysis was conducted on number of trips, recorded by block.

- Astrid will send revisions of written materials in light of these changes.

Commercial fisheries analysis methods

- Data were compiled by an Ecotrust team via interviews with commercial fleet from the ports within the central coast over this past summer.
    - 19 fisheries were identified by DFG and stakeholders as in need of additional information.
    - Asked fishermen where are the fishing grounds and how important are they to you? In some cases, e.g. for the salmon grounds, the fishing grounds are much larger than the study area.
- Overlay any one package over the fishing ground, as identified by the interviews with central coast fishermen, and highlight areas that represent MPAs that will potentially affect that fishery (i.e., prohibiting the take of that species). Calculate the total area affected.
- Then calculate the proportion of the total fishing ground that this affected area represents as well as the proportion of the fishing ground that lies within state waters and is affected.
- Value comes from implicit accounting method (bag of pennies approach, wherein interviewees are given a fictional 100 pennies, which they distribute over the fishing grounds, giving more weight to the areas they value most), Ecotrust did *not* conduct an impact analysis or an explicit accounting of value from these specific areas, based e.g. on catch. In general areas closer to shore are more highly valued by the fishermen.

Astrid showed results on the percent area of the total commercial fishing grounds that will be potentially affected by each MPA package for each of the 19 fisheries. She then showed the percent of commercial fishing grounds within the study area (rather than total fishing ground) potentially affected by each MPA package. Astrid reflected that Package 1 has a small impact on spot prawn, squid, and salmon fisheries, the fisheries that are well represented on the CCRSG.

Next she showed graphs of the percent value of total commercial fishing grounds that would be potentially affected by each MPA package. In some cases, you may affect a large area, but still have a small potential impact on value. Package 1 is particularly good at avoiding high economic costs because its proponents have internalized the information about high value areas that Ecotrust gathered in their surveys.

The final commercial slide shows the percentage of stated importance or value potentially impacted by the different packages within the study area fishing grounds.

Recreational fishing analysis methods

- Total area of recreational grounds potentially affected
- Maximum number of recreational trips affected (data are reported in microblocks, therefore a trip does not = 1 day; in one day a vessel may go to multiple microblocks, but each new block you visit represents a trip). Trips may be double-counted because a

single vessel may visit several blocks in one day and each is counted as a trip to that block.
- Data not available for all 19 species groups – only available for rockfish (1 big lumped category) and salmon
- Calculated total area of recreational fishing grounds potentially affected by MPA package in square nautical miles
- Calculated proportion of microblock potentially affected by each MPA and used that to calculate a proportional number of trips that would be potentially affected
- Calculated maximum number of recreational fishing trips potentially affected by each of packages

Discussion

There might be an intermediate distance from shore (between three miles and the maximal extent of the fishing grounds) that would be most relevant to show because it is the area of highest use and value for the fishery. However, that distance varies by fishery and is considered sensitive information by the stakeholders.

This study does not explicitly take into account existing RCAs or other fishery regulations because these are the status quo and new MPAs would not affect these. However, one should note that the interview data are smoothed over environmental variation, temporal differences in regulation, etc. because they are based on each fisherman's lifetime experience and may include periods with and without RCAs.

The species are listed alphabetically rather than ranked by landings, revenues or other order of importance. The SAT agreed that the species should be listed alphabetically rather than making a judgment call about which fisheries are most important or valuable. However, they suggested that Astrid add an introductory slide ranking species by their ex-vessel value, and then show the proportional impacts slide with species listed alphabetically.

Suggestions for presentation of this analysis

- Indicate whether these proportional impacts are large percentages of small area or vice versa (i.e., include total area of fishing grounds).
- Change title of slides on potential impacts to fishing ground "value" to "stated importance" to reflect the fact that value is not based directly on economic revenues, but on perceived importance.
- Emphasize that this is the maximum value that could be affected because catch might be made up elsewhere.
- For recreational fishing analysis, change units to statute miles instead of nautical miles; express this area potentially affected as a proportion of total area.
- Add total number of trips to the graph for both total fishing grounds and the central coast study region.

Next Steps

John Ugoretz and John Kirlin outlined the next steps in the process. The most up-to-date scientific review information will be posted in the next couple of days. Stakeholders will have a chance to revise their packages given the SAT's input. The BRTF will meet January 31 and February 1. Final versions of the packages will be assembled Tuesday, January 24. Proponents can send in reactions and changes up until then. Staff and the SAT will not be asked to review or analyze those revised packages. There will be a three week period after the BRTF meeting to do whatever they suggest in terms of additional analysis or modification of the packages. It is likely that the BRTF will emphasize staff and proponents working together during this period.

The SAT's next meeting will be in March, and the BRTF will have another meeting two weeks after that. An additional final analytic filter will be required at some point before the proposals go back to the BRTF. Latest versions of all evaluations are due by 10 a.m. on Monday the 23rd. All evaluation documents should be marked "Draft".

Final suggestions for presentations

- Figure 3 from Rick Starr's presentation – put on one page all the different packages for the same subregion to allow inter-package comparison
- Individual subregion comparisons are a second tier of detail. May only want to show them to make the point that those data are available, but focus primarily on the regional level results.
- Table 1 – would be good to add the whole region (i.e., all subregions together) as an overview.
- Need to distill the results with regard to goal 6, network function. Steve Gaines and Loo Botsford can make the point about how the packages differ in "networkedness". They will need to clearly explain how their approaches differ. When thinking about spacing using Loo's method, production outside the MPAs matters (i.e., fishing levels outside reserves will impact connectedness).
- Address whether the drop off in persistence observed in the southern part of the region is driven by habitat limitation or whether there is potential to improve network function in this part of the region.
- Be clear about which goals are being evaluated, and the fact that goal 5 is not being evaluated.
- Work in Steve Palumbi's results on replication (goal 3).
- Additional analysis of how well the packages are set up for experimental replication, controls, and monitoring could be useful but has not yet been done.
- Loo Botsford's analysis was not conducted using the most up to date versions of the packages. It should be redone or put forward as an example of the type of analysis that could be done. Staff will work with Loo to decide on how to proceed.
- List the packages in the same order in all presentations: package 1 at top of graph, AC at the bottom.

- Aim for as much accuracy and consistency as possible among the presentations. Hopefully we can combine them into a single integrated presentation.
- If SAT will give us license, staff would like to construct an integrated decision framework for the BRTF based on these analyses.

Identification for the BRTF of High Level Difference in MPA Packages

Steve Barrager led a discussion designed to draw out the high level insights that have been gleaned in the evaluation so far. Steve asked the group members what they have learned that is going to help the BRTF with its decisions. What are the relative strengths and weaknesses of the different packages; where are there areas for improvement? For the presentation, the SAT should state these insights and then provide the evidence that supports each insight. The following is a list of insights generated by the SAT, going around the room and each adding observations and insights until there were no new comments. The SAT members then voted on those insights that they thought were most important. Each member had 11 votes to cast.

1. All of the packages seem to show a significant improvement compared to the default (package 0) in their conservation value. **5**
2. In terms of ecological protection, Package 1 tends to offer the least protection in terms of size and spacing; Package 2 offers the most. **4**
3. We've shown how well the proposed configurations perform for the persistence of populations. **2 (keep)**
4. All the packages appear to meet the MPF guidelines, which appear to exceed the MLPA requirements. **1 (contrary to another insight listed above, needs to be investigated)**
5. All of these packages tend to increase conservation value over the status quo, but differ in how well they protect the various habitats within the study region. **7**
6. Packages 2 and AC appear to protect similar amounts of habitat at a high level. Packages 1 and 3 provide lesser amounts of high level protection. **9**
7. Package 1 protects the least amount of both shallow and deep rocky habitat. Other three packages protect similar amounts of rocky habitat, and more than Package 1. **3**
8. For meeting goals 1, 2, 4 and 6, packages 0 and 1 are deficient based on size, protection level and likelihood for population persistence. **8**
9. Based on the improvements between October and January, significant improvements and win-win situations could be achieved with more data and interpretation. **5**
10. Based on recreational fishing data, proposals differ significantly more in terms of restrictions on commercial fishing than on recreational fishing. Effects on recreational fishers are similar across all packages, while there are greater differences in the impacts on commercial fisheries among packages. **6**
11. Half or more of all MPAs within the packages were too small based on our guidelines. (50-87%) **6**

12. Packages 2, 3 and AC each have several MPAs which individually contribute to significantly greater impacts to one or two commercial fisheries or moderate impact to a greater number of commercial fisheries, compared to Package 1. **2 (keep)**
13. Via small changes in boundaries or changes in activities, protection levels could be increased. **5**
14. In general, network function seems to be stronger in the north than the south across all packages. **4**
15. There is a lot of uncertainty in the underlying data and the modeling and assessments we have made. I would encourage the BRTF to ask questions. **3**
16. With more time we could describe the potential impact of existing uncertainties in a better way. **3**
17. Given the differences in the packages, the similarities are surprising. Differences seem to be in level of protection and economic impact by area and community. **5**
18. All packages included many MPAs smaller than that recommended by the SAT. Nonetheless the packages still differ in the number of MPAs that are too small, so this should be taken into account in comparing them. **2 (already included in another statement)**
19. From a biological perspective, the SAT is focused on the high levels of protection to meet the goals and underemphasized the value provided by MPAs with lower protection levels. **3**
20. For goal 3, all the packages meet or come close to meeting the replication criterion, with the possible exception of deeper water habitat. **4**
21. From a socioeconomic perspective, we focused on the maximum effects on recreational and commercial fishermen and ignored any effects on nonconsumptive users. **7**
22. We haven't paid attention to why we have SMCAs in the first place. We have not considered inter-species or interactivity effects of SMCAs.
23. We have explicitly had to define what we mean by level of protection within the evaluation process. **3**
24. All the packages have many MPAs that meet or are closer together than minimum SAT guideline for spacing. **3**
25. In some geographies user group needs/interests outweigh the ecological values (e.g. Monterey waterfront). **0**
26. Package 1 appeared to have a lesser impact on commercial fisheries than the other three packages. **0**
27. All packages do well with regard to spacing of high protection MPAs in shallow, but not deeper habitats (but like the northern/southern comparison, habitat availability needs to be considered for this conclusion). **2 (keep)**
28. The analysis of persistence is an ecologically more comprehensive way of assessing population protection than individual guidelines. **3**
29. DELETED – redundant
30. Each of the packages represents a thoughtful analysis and a potential solution to the problems posed by the MLPA. **4**

31. The experience of this round of evaluations and analyses is suggestive of tools and analyses that would be helpful in other regions. **1 (keep)**
32. All of the packages did a good job minimizing impacts on recreational fishing and as a consequence, commercial fishing bears the brunt of impacts in areas of high protection. **3**
33. Differences between packages 2, 3 and AC are smaller than the differences between Package 1 and these other three. **4**

The SAT re-reviewed the list to see if any of those which got a small number of votes could be eliminated. The only ones to be removed are the few that no one voted for. Staff will try to lump some of these points and prioritize them according to the voting. The list could be parsed into (a) hypotheses that need further investigation, (b) lessons learned, and (c) practical advice for BRTF decision-making. It will be circulated to the SAT on Monday.

This table of insights will be presented to the BRTF as a complement to the more detailed presentation of the SAT's evaluation. It is a more qualitative summary of the quantitative results, and should reflect their best professional judgment. High priority insights identified here will then have to be backed up by evidence from the evaluations.

Other Evaluation Materials

Mark Carr asked what the status of the Bren School students' analysis of the packages was and what the staff's impression of their efforts was. John Kirlin responded that Bren School students, under the direction of Satie Airame, have been conducting a MARXAN analysis of ecological and socioeconomic values of the different packages. John indicated that it will be difficult to bring the Bren School analysis into the process now because of differences in spatial resolution (microblock for their analysis), etc. It may be useful as proponents move forward and think about modifying their packages. MLPA Initiative staff will talk with Satie Airame about how to bring this work to the SAT and to project proponents. This will require a meeting to discuss the methods and how the results should be interpreted. We might want a one day caucus among the Bren School group, members of the SAT, and proposal proponents to introduce them to MARXAN and share and discuss the results.

Public Comments

Steve Shimek – Packages were prepared under guidance provided by John Kirlin and John Ugoretz that kelp leases would not be considered in the evaluation. The SAT evaluation should be consistent with what staff told proponents to do.

Dave Edlund – In what format will we get feedback from the SAT so that we can make revisions to our plans? Will we get specific feedback or general feedback? On the topic of SMCAs, we feel like they are the stepchild of the process and don't get enough credit. Most of focus of the SAT has been on high level protection areas, but we feel like moderate level SMCAs should count toward goals 1 and 4.

Karen Garrison – Is there any chance of getting specific feedback in a summarized way (maybe staff can summarize evaluations so far)? Statements about the relative performance of the different packages should be well qualified based on the uncertainties of the data (especially socioeconomic data).

Jesus Ruiz – We have made some changes to Package 2 which we will submit by Monday at 10 a.m.

Upcoming meetings

Thursday, March 2, 2006 in San Luis Obispo

The evaluation subteam will meet between now and March 2 to further discuss the evaluation.